

New Claims

Applicants have added new claims 7-12 and respectfully assert that these claims are patentable over the art of record and in particular JP 2000-171470. The automatic analyzer and method for detecting a surface position of liquid in an automatic analyzer according to the present invention, accurately detects a surface position of the liquid, for example by using control means that compares an electrostatic capacitance attained while the pipetting probe is moved down with a standard electrostatic capacitance. In general, as a pipetting probe descends to the liquid surface, the problem of static electricity discharge in the sample container can occur producing an error in the detection of the liquid surface. To overcome this problem, the present invention moves the pipetting probe down to a preset position and measures a standard electrostatic capacitance between the pipetting probe and the liquid in the container relating to the position that is set. Then, a surface position of the liquid is detected by comparing the electrostatic capacitance obtained while moving the pipetting probe down with the standard electrostatic capacitance.

Figure 2 shows the problem to which the present invention is addressed. In particular, at a position (B), if the sample container 101 is charged with static electricity, the static electricity is discharged toward the tip of the probe 105 at this point. Since position (B) is several millimeters above the top of the sample container 101, as shown in Figure 2, a noise due to this discharge may cause a false liquid surface to be detected and thereby stop descent of the probe 105. According to the present invention, the probe's descent is stopped at the position (B) long enough to fully discharge static electricity of the sample container. Since a standard electrostatic capacitance is acquired at the halt position (B), the possibility of wrongly detecting the liquid surface due to disturbance noise can be minimized.

The JP '470 reference is relied upon for disclosing an automated analyzer having a pipette 105 and a detector 150 that detects the type of container and a computer that uses the detected type of container to determine the height at which the probe is stopped during lowering to permit the discharge of static electricity or other noise. Applicants respectfully disagree with this interpretation of the reference, however.

The translation of JP '470 that is relied upon in the Office Action was translated by computer and is awkward. Foremost, the translation does not state that the probe is stopped during descent from dead position A to the position in which the probe is immersed in the sample liquid. The phrase "and to make it stop" in paragraph [0008] is referring to the stopping of the probe after the probe is immersed in the sample. Accordingly, the description provided in paragraph [0008] cannot be relied upon in the manner set forth in the Office Action.

Note that the Abstract is not translated by computer and accurately describes the movement of the probe, as follows. In detecting the liquid level, the Abstract states that the dispensing probe 105 is first moved down at high speed to a preliminary set position. Then the dispensing probe is switched to a low speed, enters the sample while being moved down at the low speed and stopped. This description is consistent with the figures, also. As shown in Drawings 5, 7 and 10, the driving motor drives the probe at a first speed and then switches to a second slower speed, however there is no stopping of the probe, as in the present invention.

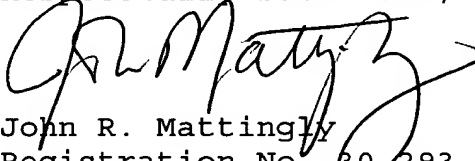
When paragraph [0008] of the English translation of the JP '470 patent is considered in context with the remainder of

the disclosure of the reference, it is clear that the stopping of the probe occurs only at the point in which the probe is immersed in a sample in the container. The drawings do not support an interpretation that the probe is stopped at the point at which the speed is changed during movement of the probe toward the sample surface. Therefore, the JP '470 patent publication does not anticipate or render obvious the invention as claimed in new claims 7-12.

Conclusion

In view of the foregoing amendments and remarks, Applicants contend that the above-identified application is now in condition for allowance. Accordingly, reconsideration and reexamination are respectfully requested.

Respectfully submitted,



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